
To the Editor:

Haussen et al1 present an interesting series demonstrating an improvement in TICI (Thrombolysis in Cerebral Infarction) revascularization using the push and fluff technique (PFT) for deploying the Trevo Retriever device (Stryker, MI) over standard unsheathing technique. PFT is an interesting technique which seems to be an adaptation of techniques first described in the pipeline embolization device, but there are distinct differences in the response of a braided stent and a closed cell laser-cut stent. The authors propose to increase radial force and clot capture of the stent by increasing coaxial force (pushing and fluffing). Although the authors suggest concerns regarding excessive radial force resulting in arterial rupture, we propose that arterial rupture is unlikely and that this is not likely the mechanism of complication from the PFT. In our opinion, the force vector in pushing a closed cell stent would be in an oblique direction (distal and outward), resulting in a combination of shearing and compression of the adjacent endothelium. To convert the coaxial pushing force into an outward radial force, there needs to be resistance to distal movement, reflected in the shearing force against the endothelium. Such injury may manifest as focal dissection with subclinical distal embolic phenomenon. These theoretical mechanisms of arterial trauma may be better evaluated with in vivo studies and may not be demonstrated in vitro studies, which focus primarily on the mechanical outcomes.

Second, the safety end points included in study are the rates of parenchymal hematoma and subarachnoid hemorrhage. It is arguable that study of these clinical outcomes would obviate theoretical or in vivo models. The authors report an equal incidence of intraparenchymal hemorrhage in both groups (not statically significant). However, inspection of the study size and a power analysis demonstrates that a study with 151 patients would only be reasonably expected to show statically significance only if the hemorrhagic complications increased from 10% in the control group to 31% in the PFT group, which would outweigh the benefits of a slight improvement in revascularization.2 A reasonable balance may suggest a study of ≈250 patients in each arm, α of 0.05, 1−β of 0.8, and with 1-tailed analysis; this would be reasonably expected to detect a true increase in complication of > 8%, from 10% to 18%.

We agree that PFT is an interesting technique that may improve clot retrieval and improved recanalization; the technique should be validated in large studies, before concluding its safety profile.

Acknowledgments

We appreciate Dr Mohammad Ali Aziz-Sultan, MD, for providing technical details of the procedure and complications associated with them. Dr See contributed in drafting/revising the manuscript for content, analysis, and interpretation of data, concept, and design. Dr Khandelwal contributed in drafting/revising the manuscript for content, analysis or interpretation of data. Dr Patel contributed in revising the manuscript for content, study concept and design, analysis or interpretation of data, clinical evaluation and management, and study supervision.

Disclosures

None.

Alfred P. See, MD
Priyank Khandelwal, MBBS
Nirav J. Patel, MD
Department of Neurosurgery
Brigham and Women’s Hospital
Boston, MA

Letter by See et al Regarding Article, "Optimizing Clot Retrieval in Acute Stroke: The Push and Fluff Technique for Closed-Cell Stentriever"
Alfred P. See, Priyank Khandelwal and Nirav J. Patel

Stroke. 2016;47:e31; originally published online December 29, 2015;
doi: 10.1161/STROKEAHA.115.011935

The online version of this article, along with updated information and services, is located on the World Wide Web at:
http://stroke.ahajournals.org/content/47/2/e31